

**REMARKS / ARGUMENTS**

This application is believed to be in condition for allowance because the claims, as amended, are believed to be allowable over the cited references. The following paragraphs provide the justification for this belief. In view of the following reasoning for allowance, the Applicant hereby respectfully requests further examination and reconsideration of the subject patent application.

**1.0 Rejections under 35 USC §102(e):**

In the Office Action of May 14, 2007, claims 12, 14 and 15 were rejected under 35 USC §102(e), as being anticipated by U.S. Patent Application Publication No. 20020181762 to Silber (hereinafter "**Silber**").

A rejection under 35 USC §102(e) requires that the Applicant's invention was described in patent granted on an application for patent by another filed in the United States before the invention thereof by the Applicant. To establish that a patent describes the Applicant's invention, all of the claimed elements of an Applicant's invention must be considered, especially where they are missing from the prior art. If a claimed element is not taught in the referenced patent, then a rejection under 35 USC §102(e) is not proper, as the Applicant's invention can be shown to be patentably distinct from the cited reference.

In view of the following discussion, the Applicants will show that one or more elements of the Applicants claimed invention are missing from the cited art, that the cited art requires one or more elements that are not used by the Applicants claimed invention, and that the Applicants invention is therefore patentable over that cited art.

**1.1 Rejection of Independent Claim 12:**

In general, the Office Action rejected independent claim 12 under 35 USC §102(e) based on the rationale that the **Silber** reference teaches the Applicants' claimed computer-readable medium..." for **removing occlusions** from a composite image. However, in view of the following discussion, Applicant will show that the **Silber** reference does not teach the Applicants claimed invention, and that the claimed invention is therefore patentable over the cited art.

Applicant believes that the Office Action is misinterpreting the term "occlusion" with respect to the common usage of that term with respect to image processing applications. In particular, with respect to the issue of occlusions, the Office Action suggests that the **Silber** reference discloses "identifying areas of potential occlusions in each of the aligned images..." The Office Action justifies this determination by stating that "*any region that is masked or not used in further processing is an occluded region since the region is obstructed from further processing.*"

In contrast to the position advanced by the Office Action, Applicant respectfully suggests that commonly accepted meaning of the term occlusion in image processing is ***an area or region in one image of a scene that is at least partially occluded (i.e., at least partially hidden from view or partially covered) by one or more objects in another image of the scene.*** This is clearly the intended meaning of the term occlusion with respect to the present claims. Further, Applicant believes that this is the only reasonable interpretation of the term "occlusion" in view of the present specification. Therefore, to assist the Examiner in correctly interpreting the intended scope of the claims, Applicant has amended independent claim 12 to include the following limitation:

"...wherein an occlusion represents an area in any of the images that is at least partially obstructed from view by one or more objects in one or more of the other images..."

As discussed in the Applicants prior response, **Silber** is incapable of identifying areas of potential occlusion since **Silber** instead acts to determine a best level of focus for edges of a single object for each image in a set of images of that object captured at different levels of focus.

Clearly, evaluating edge focus levels to determine whether an edge is **adequately focused** in view of some **predetermined focus threshold** (e.g., the “numerical threshold value” described by **Silber**) fails completely to provide a technique for deciding whether a particular edge represents the boundary of an object that is occluding some portion of a scene.

Therefore, in view of the preceding discussion, it is clear that the present invention, as claimed by independent claim 12 has elements not disclosed in the **Silber** reference. Consequently, the rejection of claim 12 under 35 USC §102(e) is not proper. Therefore, Applicant respectfully requests reconsideration of the rejection of claim 12, and thus of dependent claims 14 and 15, under 35 USC §102(e) in view of the language of claim 12, as amended. In particular, claim 12 recites the following novel language:

“A system for removing occlusions from a composite image formed from a set of images of a scene, comprising:

acquiring at least two images of a scene from approximately the same viewpoint;

aligning each of the images to a base image selected from the set of images;

**identifying areas of potential occlusion in each of the aligned images, wherein an occlusion represents an area in any of the images that is at least partially obstructed from view by one or more objects in one or more of the other images;**

selecting a seed image from the set of images;

**determining whether each area of potential occlusion in the seed image is an actual area of occlusion** by examining each area of potential

occlusion in the seed image to determine whether a level of discontinuity along an outer edge of each area of discontinuity exceeds a predetermined threshold;

***replacing areas of actual occlusion in the seed image with corresponding non-occluded areas from one of the other images*** in the set to form a composite image from the seed image.” (emphasis added)

## **2.0 Rejections under 35 USC §103:**

The Office Action rejected claims 1-3, 7-9, 11, 17-19 and 21 under 35 USC §103(a) as being unpatentable over ***Silber***, in view of U.S. Patent No. 6,366,316 to Parulski, et al. (hereinafter “***Parulski***”).

In order to deem the Applicant's claimed invention unpatentable under 35 USC §103(a), a prima facie showing of obviousness must be made. However, as fully explained by the M.P.E.P. Section 706.02(j), to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, ***the prior art reference (or references when combined) must teach or suggest all the claim limitations.***

Further, in order to make a prima facie showing of obviousness under 35 USC 103(a), all of the claimed elements of an Applicant's invention must be considered, especially when they are missing from the prior art. If a claimed element is not taught in the prior art and has advantages not appreciated by the prior art, then no prima facie case of obviousness exists. The Federal Circuit court has stated that it was error not to distinguish claims over a combination of prior art references where a material limitation in the claimed system and its purpose was not taught therein (*In Re Fine*, 837 F.2d 107, 5 USPQ2d 1596 (Fed. Cir. 1988)).

## 2.1 Rejection of Claims 1-3, 7-9 and 11:

In general, the Office Action rejected independent claim 1 under 35 USC §103(a) based on the rationale that the **Silber** reference discloses the claimed invention with the exception of “comparing the set of images to identify areas of difference between the images for all images, said areas of difference representing regions of potential occlusion in each image.” The Office Action then continues by suggesting that this feature lacking in the **Silber** reference is disclosed by the **Parulski** reference.

However, as discussed above in Section 1.1 with respect to the rejection of claim 12, the **Silber** reference is incapable of determining, for any image, whether regions of potential occlusion represent actual regions of **occlusion**. In particular, Applicant has defined occlusion in claim 1 in an identical manner to claim 1 as follows:

“...wherein an occlusion represents an area in any of the images that is at least partially obstructed from view by one or more objects in one or more of the other images...”

As discussed above, the **Silber** reference operates by identifying edges in a set of images that represent the best levels of focus for particular edges. **Silber** does not have any capability to determine whether one region is **occluding** another. Note that the discussion provided in Section 1.1 is incorporated by reference for purposes of brevity rather than repeat that entire discussion here.

Consequently, the proposed **Silber-Parulski** combination fails to disclose the elements of Applicant's claimed invention. As such, it is clear that the present invention, as claimed by independent claim 1 includes elements not taught in the proposed **Silber-Parulski** combination reference. Consequently, the rejection of independent claim 1, and of dependent claims 2-3, 7-9 and 11, under 35 USC §103(a) is not proper. Therefore, the Applicants respectfully requests reconsideration of the rejection of claims 1-3, 7-9 and 11,

under 35 USC §103(a) in view of the novel language of claim 1, as amended. In particular, claim 1 recites the following novel language:

“A physical computer-readable medium having stored thereon computer executable instructions for automatically constructing an image mosaic from a set of images of a scene, said computer executable instructions comprising:

- inputting a set of images of a scene;
- registering the set of images;
- comparing the set of images to identify areas of difference between the images for all images, ***said areas of difference representing regions of potential occlusion in each image, wherein an occlusion represents an area in any of the images that is at least partially obstructed from view by one or more objects in one or more of the other images;***
- determining, for each image, whether regions of potential occlusion in each image represent actual regions of occlusion, or whether the regions of potential occlusion in each image represent regions of non-occlusion, by determining a level of discontinuity along an exterior border of each region of potential occlusion in each image; and***
- creating a mosaic image by replacing at least one actual region of occlusion in one image from the set of images with corresponding regions of non-occlusion from at least one other image from the set of images of the scene.***” (emphasis added)

## **2.2 Rejection of Claims 17-19:**

The Office Action rejected claims 17-19 in view of the proposed ***Silber-Parulski*** combination discussed above. However, claims 17-19 are dependent from claim 12, which as discussed above in Section 1.1 is allowable under 35 USC §102(e).

Consequently, since the parent claim (claim 12) of claims 17-19 is allowable, citing additional references in attempt to show equivalence to particular features of dependent claims still fails to address the novelty of the parent claim. As such, since claim 12 is allowable, dependent claims 17-19 are also inherently allowable. Consequently, Applicant respectfully traverses the rejection of claims 17-19 in view of novelty of claim 12, as discussed above.

### **2.3 Rejection of Claim 21:**

In general, the Office Action rejected independent claim 21 under 35 USC §103(a) based on the rationale that the **Silber** reference discloses the claimed invention with the exception of "comparing each of the aligned images to identify areas of potential occlusion in each of the aligned images." The Office Action then continues by suggesting that this feature lacking in the **Silber** reference is disclosed by the **Parulski** reference.

However, as discussed above in Section 1.1 with respect to the rejection of claim 12, the **Silber** reference is incapable of determining, for any image, whether regions of potential occlusion represent actual regions of **occlusion**. In particular, Applicant has defined occlusion in claim 1 in an identical manner to claim 1 as follows:

"...wherein an occlusion represents an area in any of the images that is at least partially obstructed from view by one or more objects in one or more of the other images..."

As discussed above, the **Silber** reference operates by identifying edges in a set of images that represent the best levels of focus for particular edges. **Silber** does not have any capability to determine whether one region is occluding another. Note that the discussion provided in Section 1.1 is incorporated by reference for purposes of brevity rather than repeat that entire discussion here.

Consequently, the proposed **Silber-Parulski** combination fails to disclose the elements of Applicant's claimed invention. As such, it is clear that the present invention, as claimed by independent claim 21 includes elements not taught in the proposed **Silber-Parulski** combination reference. Consequently, the rejection of independent claim 21 under 35 USC §103(a) is not proper. Therefore, the Applicant respectfully traverses the rejection of claim 21 and requests reconsideration of the rejection of claim 21 under 35 USC §103(a) in view of the novel language of claim 21. In particular, claim 21 recites the following novel language:

A computer-implemented process for removing occlusions from a mosaic image created from a set of images of a scene, comprising:

- inputting a set of two or more images of a scene;
- aligning each of the images to a base image selected from the set of images;
- comparing each of the aligned images to **identify areas of potential occlusion in each of the aligned images, wherein an occlusion represents an area in any of the images that is at least partially obstructed from view by one or more objects in one or more of the other images;**
- determining a level of discontinuity along an outer edge of each area of potential occlusion for each image,** said level of discontinuity indicating an area of actual occlusion where the level of discontinuity exceeds a predetermined discontinuity threshold, and **said level of discontinuity indicating an area of non-occlusion where the level of discontinuity is less than the predetermined discontinuity threshold;**
- creating an image mask for each image, said **image masks indicating areas of occlusion and areas of non-occlusion for each image;** and
- using the image mask for each image for creating a mosaic image by **replacing areas of actual occlusion in one of the images with**



***corresponding areas of non-occlusion from one of the other images."***  
(emphasis added)

**3.0 Rejection of Claims 4-5, 10, 13, 16, 20, and 22-28, under 35 USC §103(a):**

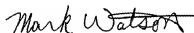
The Office Action rejected dependent claims 4-5, 10, 13, 16, 20, and 22-28 in view of the proposed **Silber** reference in combination with various other references. However, claims 4-5, 10 are dependent from claim 1, which as discussed above in Section 2.1 is allowable under 35 USC §103(a). Similarly, claims 13, 16, and 20 are dependent from claim 12, which as discussed above in Section 1.1 is allowable under 35 USC §102(e). Finally, claims 22-28 are dependent from claim 21, which as discussed above in Section 2.3 is allowable under 35 USC §103(a).

Consequently, since each of the parent claims of dependent claims 4-5, 10, 13, 16, 20, and 22-28 (e.g., claims 1, 12 and 21) are allowable, citing additional references in attempt to show equivalence to particular features of dependent claims still fails to address the novelty of the parent claims. As such, since claims 1, 12 and 21 are allowable, dependent claims 4-5, 10, 13, 16, 20, and 22-28 are also inherently allowable. Consequently, Applicant respectfully requests reconsideration of the rejection of claims 4-5, 10, 13, 16, 20, and 22-28 in view of novelty of their respective parent claims, as discussed above.

**CONCLUSION**

In view of the above discussion, it is respectfully submitted that claims 1-28 are in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of claims 1-28 and to pass this application to issue at the earliest opportunity. Additionally, in an effort to further the prosecution of the subject application, the Applicant kindly invites the Examiner to telephone the Applicant's attorney at (805) 278-8855 if the Examiner has any additional questions or concerns.

Respectfully submitted,



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